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ABSTRACT

Under the assumption that women and minority business college students have had little opportunity to develop the interpersonal and community membership skills required in business management, this paper reviews some of the research on socialization, group process theory, and the development of college students, and relates it to the special needs of women and minorities. It singles out Guided Design as a useful pedagogical tool for teaching committee skills and finds merit in the approach's emphasis on small group cooperation in solving a structured series of problems within a case situation. The paper describes a study in which 26 business statistics students of Anglo, Hispanic, black, or foreign origin were exposed to a Guided Design exercise involving the completion of 23 tasks over a total of 10 class hours. Findings, based on the author's observations and students' reports and assessments, tentatively supported the hypotheses postulated: women and/or minority students experience fewer roles than white males and consequently have different role learning goals; women and/or minority students played more unfamiliar roles during the class exercise; and a high percentage of students reported that the exercise was effective in teaching both roles and statistics. Questionnaires and Guided Design exercises are included. (MJL)

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Improving Committee Membership Skills of
Women and Minority
Business College Students

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ABSTRACT

Women and minority business college students often have had little opportunity to develop the interpersonal and committee membership skills that business management requires. This paper relates educational research on college student development to the special needs of women and minorities, as well as to psychology and social work literature on social and task-specific learning in small groups.

Guided Design is a case-type teaching format which meets the pedagogical criteria suggested by a review of these diverse bodies of literature. This paper concludes by summarizing the results of a pilot study in which Guided Design was successfully used to teach women and minorities new interpersonal skills simultaneously with traditional statistics.

Interpersonal skills, in particular, committee membership skills, are universally recognized as important - in fact, determinants of success - for managers. It is clearly important, then, for business schools to make certain that graduates are equipped with these skills.¹ This paper discusses why women and minority students may need help in developing these skills, suggests one pedagogical tool, Guided Design, for teaching these skills, and reports on the author's experience in assessing and trying to teach these skills within the context of business statistics courses.

After studying and experimenting with Guided Design, I have found it to be especially suitable for training business students. The method efficiently uses class time to simultaneously teach a traditional subject matter, problem-solving skills, and committee and group participation skills.

WHY MAY SOME WOMEN AND MINORITY STUDENTS NEED SPECIAL HELP IN LEARNING COMMITTEE SKILLS?

Socialization into a culture invariably prepares persons for the types of roles typical of members of that culture. Inevitably, students' personalities are molded in accord with the experiences and expectations of their families. Those students who have not been socialized to become business managers may need special learning and re-learning opportunities.

Around 1975, women made up 39% of the labor force, but less

¹ For example, Loren B. Belker devotes an entire chapter of the First Time Manager, Amacom, N.Y., 1978, to "Managing, Participating in, and Leading Meetings."

than 5% of those earning more than \$10,000 a year in the census category of "Officials, Managers, and Proprietors" were women.² Although more and more women are entering management each year,³ many women did not grow up with specific expectations of being managers. They have often ^{had little opportunity} ~~not~~ worked to acquire the interpersonal and leadership skills most needed in roles played by managers.

National statistics clearly indicate that minority students are more likely than non-minority students to come from lower- and working-class backgrounds. In 1978, 30.1% of white males and 22.4% of white females employed in the U.S. civilian work force were white collar "professional, technical and kindred workers" or "managers and administrators." Only 16.3% of males of other races and 16.7% of females of other races were in the same categories.⁴ Given the higher rates of unemployment and larger family sizes of minority groups, at least twice as many minority students have parents who are not managers or professionals, and hence, are not experienced in many of the roles managers play.

There is also some evidence to suggest that students whose native language is not English may have different thought and communication patterns. Even those articulate in English may need special socialization opportunities for learning how members of

² Margaret Hennig and Anne Jardin, The Managerial Woman, Simon and Schuster, New York, 1976,

³ See Table 12-17 in A Statistical Portrait of Women in the United States: 1978, Current Population Reports, No.100, p.23.

⁴ U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings, Vol. 26, No. 1.

majority culture think and use language.⁵

The world of managers and professionals is, then "foreign territory" to a disproportionately high number of women and minority business students. This unfamiliarity ^{most likely} ~~may or may not~~ mean^s these students are inexperienced in some important roles and skills ^{which} ~~and~~ hinders their development of self-confidence and their willingness to aggressively pursue business contacts.

"Unless people not only are, but believe that they are equally able or competent to compete, they will not willingly or successfully integrate themselves with more powerful individuals and groups."⁶ Hennig and Jardin discuss and document differences between men and women's self-perceptions and self-confidence. Differences in interpersonal skills are shown to hamper women's confidence and job performance as managers. There is reason to believe many minority group members suffer similar disadvantages as managers.

WHAT GUIDANCE CAN EXISTING KNOWLEDGE AND THEORY OFFER THOSE CONCERNED ABOUT CORRECTING THESE DISADVANTAGES?

Socialization Theory

Piaget's famous observations on socialization point out that games and activities with peers (and family) help a child develop an understanding of human interaction and the reciprocity of relationships.⁷ The internalization of standards and norms in this

⁵ See, for example, Lorraine Obler and Martin Albert, The Bilingual Brain, 1978.

⁶ Hennig and Jardin, Op cit., p. 14.

⁷ J. Piaget, The Moral Judgement of the Child, Collier, New York, 1962.

way are a major step toward autonomy of behaviors in groups. Similarly, the process by which business students form norms and standards for behavior and learn to play roles is complex and greatly influenced by the kinds of family and peer contacts that students have. Differences in family backgrounds have already been briefly discussed above. Generally, students form peer groups with those sharing similar norms.

Scholarly study of the development of college students has begun to come into its own in the past decade. William Perry, championing those who believe students develop by progressing unevenly from stage to stage, identified several stages of development and forms of "non-development" in college students. Although Perry's model examines intellectual growth primarily - and not how interpersonal skills are gained - he claims that his work "confirms the desirability of cultural diversity (of student contacts) while pointing toward ways of identifying and supporting those most vulnerable to cultural shock."⁸ Also, he notes that it greatly helps students to see - and be similarly seen by - others as groping toward the ability to rely on their competence to form opinions and "commitments" or faith in hypotheses.⁹ Opportunities for work in small groups can thus be intellectually and socially beneficial.

Building on Perry's work, more specifically prescriptive developmental models have been constructed. Knepfelkamp and Slepitzka,

⁸ William G. Perry, Jr., Forms of Intellectual and Ethical Development in the College Years: A Scheme, Holt, Rinehart and Winston, New York, 1968, p. 209.

⁹ Ibid., p. 213.

for example, have created such a model of the qualitative changes which occur as college students mature. They found the ability to take on new roles to be an important aspect of students' development.¹⁰ They imply, however, that students can be expected to tackle new roles only after mastering several other developmental stages, including the ability to process information from a personal perspective, analyze and synthesize this information, be open to alternatives, and assume responsibility for their own opinions and actions.¹¹ Ideally, business education must offer opportunities and encouragement for development of all these aspects of learning and competency - as prerequisites to the acquisition of committee membership skills.

A competing view of the development of college students depicts student progress as more linear, as students develop different aspects of maturity and competence at varying rates. While students may appear to progress through stages, this is "more likely the result of societal or educational demands for certain types of adaptations at different periods in one's life."¹²

Heath, a leading theorist of the more continuous developmental school, reports that his "research and teaching experience suggest that cognitive maturation in college may be best facilitated

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L. Lee Kniefelkamp and Slepitzka, "A Cognitive-Developmental Model for Career Development: An Adaptation of the Perry Scheme," in Parker, Op cit. pp. 137-8

11 This is a very brief summary of a much more elaborate theory described in Kniefelkamp and Slepitzka, Ibid.

12 Douglas H. Heath, "Comments " in Parker, Op cit. p. 67.

by high motivational involvement and faculty expectations, extensive modeling of alternatives, and close monitoring of very frequent student activities requiring the specific cognitive skills being assessed, with frequent detailed feedback about progress.¹³

Heath essentially feels that development is best furthered by course work which changes the classroom environment in ways which require new adaptations of behavior and thought, or disorganizes students while minimizing confusion. Also, he notes that as students find new ways of coping, they need opportunities to repeat and internalize these new behaviors.¹⁴

Group Process Theory

In the mid-1940's psychologists, laid claim to the study of group processes, developing the fields of experimental and experiential group psychology. Much of this work, especially the experiential studies, was conducted in industrial or other economic-task-centered organizations. Since the 1940's, the major portion of research and theory building has studied the development of interpersonal skills within group processes.¹⁵ Most early studies concerned with cognitive process, however, have tended to place primary emphasis on measurement of socio-emotional factors. Scholars from a variety of disciplines have only recently begun the task of collecting data and building theory on the processes of effective cognitive and task-specific learning in groups. For example, work

¹³ Heath, Op cit., p. 69.

¹⁴ Douglas H. Heath, "A Model of Becoming a Liberally Educated and Mature Student," in Parker, Op cit., p. 208.

¹⁵ Mountains of literature deal with T-group, encounter groups, and gestalt groups, for example.

in effectiveness groups, which are primarily teaching "effective use of self" in task accomplishment, has been developed by Argyris and Schon (1974) in the area of education and organizational development.

In a study which examined several possible determinants of success in problem-solving, Bouchard concluded "there is no question that interpersonal effectiveness is a powerful predictor of problem-solving effectiveness in small groups."¹⁶ Social ability was also found to predict success in small groups. Students' interpersonal effectiveness and social ability are, of course, related to their socialization experiences.

Social work literature discusses practical applications of group process theory. For example, Thelen discusses roles played within task-oriented groups. Within a group, if norms and roles conflict, those of the higher status persons prevail. Over time, however, with repeated interaction, these norms become mutual agreements - eventually open to change and revision by all group members. Through varied group experiences, all students can learn new ways of perceiving and assessing their own status, learn about others' role expectations, and learn how rewards are gained, status is earned, and how their own role-playing is malfunctional or self-defeating.¹⁷ More specifically, providing opportunities

¹⁶ Thomas J. Bouchard, "Personality, Problem-Solving Procedure, and Performance in Small Groups," Journal of Applied Psychology, Vol. 53, No. 1, Part 2, pp. 24-25.

¹⁷ See Rosemary C. Sarri and Maeda J. Galensky, "Conceptual Framework for Group Development," in Individual Change Through Social Groups, Paul Glaser et al (eds.), Macmillan Publishing, N.Y., 1974, and Chapter 10 in Herbert A Thelen, Dynamics of Groups at Work, University of Chicago Press, Chicago, 1970 Ed.

for task-focused interaction with white males can encourage women and minority group members to begin to learn the ins and outs of the business world - their future business colleagues will be the white males they sit with in business classes.

This brief mention of group process work cannot pretend to be comprehensive. It is included here to demonstrate that a helpful body of research has been neglected by business educators.

The study discussed in this paper is an attempt to influence students and partially test theories predicting effects of group processes on students' task and role learning. Other socio-emotional influences of groups on students are neglected here for pragmatic reasons. Socio-emotional aspects of groups may well be the most powerful variables for intervention, explanation, and description of student progress, but faculty members of business colleges have neither the expertise, inclination, nor peer support to attempt to manage in-classroom group activities by means of purposive socio-emotional intervention. This paper is suggesting that students' cognitive processes, the customary realm of college faculty, can be influenced through use of small group exercises to simultaneously teach new interpersonal skills and traditional curriculum subjects, such as quantitative methods. If group exercises can be built into business classes, it seems likely that women and minorities will benefit especially from opportunities to develop social and interpersonal skills and play new roles useful in task-oriented groups.

The literature briefly reviewed here suggests that business

education can prepare students for business committee membership roles by:

- 1) Encouraging task-oriented and social interaction among students with different backgrounds and ideas, especially within small group activities.
- 2) Offering a diversity of classroom environments and activities.
- 3) Offering repeated opportunities to practice new skills and behaviors with feedback.
- 4) Allow class participation at a variety of levels, accommodating the different stages or degrees of development students have attained.

WHAT ARE SOME TOOLS FOR TEACHING COMMITTEE SKILLS?

The pedagogical tool I experimented with is called Guided Design and was developed for engineering students by Charles E. Wales and Robert Stager. ^{Another teaching format - case presentations - was also considered for use because} Many business schools have incorporated a "case approach" in business courses. From my own experience, observations, and research, however, I have concluded that the straight case approach often seems to accentuate, rather than ameliorate, differences between the performance of white males and women and minority business students.

I do not hold this opinion alone. Reporting on women's participation in M.B.A. classes at Harvard, Hennig and Jardin say that, "many women found it hard to participate in class as fully as the case method of teaching required. This was as much because

of their own doubts as to whether they could or even wanted to compete with the men in class, as it was due to the response they received when they did participate."¹⁸ Hennig and Jardin's comment implies that interaction along ethnic and sex lines is probably hindered rather than facilitated in case classes.

Stead and Shin also cite similar problems in seminar- and case-oriented courses: "There always seems to be a relatively small number of students who usually dominate class discussions ... (and) there are always some students who are ^hingerently quiet or shy even when they have good points to add to the discussion."¹⁹ Feedback and role experimentation in case courses is provided, then, primarily to the dominating students.

The Guided Design format attempts to reduce the emphasis on competition, replacing it with incentives for cooperation. Not only is this more palatable to many women and minority students, it may well be more representative of the business climate these students will enter. Guided Design revolves around small groups' efforts to solve a structured series of small problems within the exontext of a single case situation. "Student groups must deal with each step in order and are not permitted to progress to a new step until they have adequately considered and dealt with the preceding one. Students work in class in groups of four to seven members, and it is as a group that they formulate their plan for

¹⁸ Hennig and Jardin, Op cit., pp. 22-23.

¹⁹ W. Edward Stead and Bong-Gon P. Shin, "Attaining Optimal Effectiveness in Case- and Seminar-Oriented Classes," Collegiate News and Views, Vol. 33, No. 1, Fall 1979, p. 9.

tackling each step."²⁰ Feedback is provided as each task is completed.

Unlike a more typical case pedagogy, Guided Design allows the instructor many tools with which to shape and encourage active participation by all students. The instructor may structure the make-up of groups to ensure interaction among diverse types of students or to group students according to ability, allowing each group to progress at its own pace. The instructor may monitor group processes, encouraging all students to participate and, possibly, grading each group on its success in involving all group members. Roles can be assigned within each group, offering several students opportunities to experiment with roles of leadership, pace-setting, and progress-reporting.

Class discussion takes place in small groups; students who are uncomfortable speaking up in large classes are given opportunities to "practice" speaking in less threatening, smaller groups. Committee skills are also learned; the small group more accurately resembles the types of management teams many business students will work in after finishing school.

In classes containing a mix of students, the socialization process can benefit everyone. Women and minority students are given opportunities to act as colleagues of majority-culture males. Those men who are socially isolated from most such contacts are encouraged to develop broader socialization skills also.

²⁰

Wales and Stager, The Guided Design Approach, Educational Technology Publications, Inc., Englewood Cliffs, 1978, p. 1.1.

Because problem-solving is broken down in separate but logical steps, students have more opportunity to ask questions and fully understand each step in the problem-solving process of the case. When classes contain students with varying degrees of preparation and ability, a Guided Design format assists the instructor in controlling the pace of class progress. "Tutoring" that occurs within the groups potentially benefits all students involved.

"It (Guided Design) is based on the conviction that the student who works through an ascending order of well designed problems, the student who is actively seeking solutions to problems rather than passively assimilating knowledge, will emerge not only better educated but far stronger intellectually."²¹

For students whose life experiences have not provided many models of unsupervised, skill-based problem solving in work situations, this can be a valuable tool for motivating thorough learning of the subject matter. Rather than being a gimmick which distracts students from the subject of the course, Guided Design provides opportunities for practice and immediate feedback on problem-solving success, within the subject matter of the case used.

THE STUDY

This study essentially followed a pre-test, treatment,

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Wales and Stager, 1978, p. 1.1.

post-test design. The treatment was participation in a Guided Design exercise. The small size of the classes and the limited time frame precluded the formal use of a control group. The study's scope precluded ^{me}asurement of the longer-term effects of the treatment.

The existing research reviewed above is prescriptive only in a general sense. The more developed theories are centered around concepts that are either not currently measurable, ²² or require psychological or social work training to measure and interpret. Sophisticated measurement and interpretation assistance was not available for this study. Nor did the author/researcher possess the in-depth understanding needed to directly test the theories themselves.

The following study was designed to test the usefulness of the prescriptions which the theorists themselves draw from their work. This author selected a pedagogical format which seemed to fulfill most of the theorists' recommendations. The admittedly crude measurements of the outcome of the experiment were developed with reference to the central teaching goal - role and small group skill learning-, the limited ability of the experimenter to administer testing instruments, and the simplest measurement instruments previously used in assessing individual performance in small groups.

The instrument focuses on a list of several roles commonly played by small group participants. The concepts of the role

²² See comments of Roger A. Myers and Douglas Heath in Parker, Op Cit., pp. 70-71, 201, 203.

descriptions were drawn primarily from social work literature describing group dynamics. The specific wording used in the questionnaire was developed by pre-testing the instrument on several non-minority and business students^{who were} not members of the treatment group. Asked to interpret the roles in their own words, the pre-test students described each role in very similar terms.

The study involved students in three relatively small introductory business statistics classes in the fall of 1979 at Corpus Christi State University, an institution with a scant majority of female students, about 35% Mexican American students and less than 1% black students.

The twenty-six subjects included 15 males and 11 females. Sixteen were Anglo, seven Hispanic, two Black, and one foreign. About 61% of the Anglos and 57% of the Hispanics were male. Hispanic females were youngest, followed by Anglo females, Anglo males, and Hispanic males (in that order). The women, on average^{the}, were slightly younger. Most students were ^{between} 21-25 years old, however.

Students in all three classes spent two hours (in class) participating in an introductory Guided Design exercise. The same instructor conducted the exercise in all three classes. Small groups of students were structured to maximize minority/white and male/female diversity within and across groups.

At the next class, two days after the introductory exercise, students were asked to fill out a questionnaire (Appendix A) giving personal data and information about group roles they had

experienced, would like to play in class, and felt they needed to learn. Students were assured of the confidentiality of answers, assured that answers would not be analyzed until the course was over, and assured that they were free to choose not to fill out questionnaires. The questionnaire was not interpreted for students, no questions about the survey instrument were answered, and no discussion of group roles occurred; the instructor did not want to unintentionally bias students' assessments of the desirability of roles, nor unintentionally give differing instructions to the three classes.

The "treatment" consisted of the student groups' participation in a Guided Design case (Appendix B) written by the course instructor (author of this paper). The exercise spanned ten classroom hours - five class periods. Twenty-three separate tasks were completed. For ^{every one of the} each task, each group was given an instruction sheet. When the group felt the task was completed, the instructor asked them to report their solution. When the instructor felt the task had been accomplished, a feedback handout - discussing one possible solution to the problem - and the next tasks' instructions was given to the group. The instructor attempted to respond similarly to all groups, and groups progress was approximately similar; no single group took consistently longer or shorter times to complete tasks. The instructor did not observe the process of any group. During task completion the instructor sat out of earshot of the groups, making occasional contact to ask if any group was ready to progress to another task.

The Guided Design exercise centered around a hypothetical business situation calling for a sample design, tabulation of sample data (provided by the instructor), and interpretation of results. Students were required to turn in homework assignments (problems in sampling, estimation, and hypothesis testing). No lectures on these subjects preceded the exercise; no lectures were given during exercise. Students were assigned reading in their statistics text and were told about an audio-visual self-paced learning aid on the statistics topics on reserve in the university library. Homework assignments were corrected, but not graded, and returned each class. Students were also told at the beginning of the exercise that they would be graded on two criteria: a traditional in-class exam consisting of problems similar to the homework and an assigned individual report relating to the Guided Design exercise situation - requiring students to design further research building on the group's work (due one week after the exercise was concluded.) Group participation was not graded.

On the concluding day of the exercise, students were given another questionnaire, (Appendix C) and again answered voluntarily. Using role descriptions identical to the pre-test,²³ ^{the questionnaire} asked what roles the students played and how effective they felt the exercise was in teaching new roles and in teaching statistics. (The questionnaire was completed before the exam or paper were completed.)

²³ One type of role was inadvertently included in the pre-exercise questionnaire but excluded from the post-exercise questionnaire. Comparisons of "pre" and "post" answers were adjusted accordingly.

Again the instructor did not interpret the questionnaire and roles were not discussed.

Twenty-two usable matched pre- and post-exercise questionnaire sets were obtained. Incomplete questionnaire sets,²⁴ those from students who missed more than one class, were discarded.

Primary unresolved threats to validity in this study lie in the possibility of a "Hawthorne" effect - students were told that this was a research project -, a self-reporting bias in subjects' answers, in subject-treatment and measurement instrument interaction (different students may have interpreted the exercise and questionnaire differently), and in treatment variation (differences between groups' experiences). After the exercise and grading were completed the author interviewed a random selection of students and found no reason to believe that understanding of the questionnaire or exercise varied systematically. Also, neither grades nor assessment of the effectiveness of the exercise seemed to be related to the particular group participated in by the student.

Within small groups, such as those formed in this experiment, groups assign roles to members and, simultaneously, members choose roles through habit and in response to their own needs. These choices are usually not made consciously; in this experiment they were made more than usually explicit. Thus, these findings can not directly speak to the effectiveness of learning in mixed sex

²⁴ One male Anglo student declined to participate in the post-questionnaire, being "not interested in research."

and ethnicity small groups or Guided Design formats used without some explicit examination of roles.

The short time-frame of the experimental measure may obscure the effects of the exercise. If one believes the theories that describe students' development as non-linear movement through developmental stages or levels, as for example, in Perry's developmental scheme, a one-time measure of students' behavior changes may be insufficient. The exercise²⁵ questionnaires may have caused students to prepare themselves to experiment with new roles, but some students may not have yet made a transition to a "role experimentation" stage.²⁵ This study cannot detect this occurrence nor shed any light on how many women or men, minority or majority students were thus affected.

The hypotheses tested were:

H1: Women and/or minority students have experience with fewer roles than white males, and consequently, have different role-learning goals.

H2: Women and/or minority students played more unfamiliar roles during the class exercise.

H3: A high percentage of students reported that the exercise was effective in teaching both roles and statistics.

The author was not prepared to formulate hypotheses about specific types of sex and ethnic differences in desires to learn and play roles or success in meeting personal goals, but it was hoped that useful information could be gathered to begin to address these

²⁵ See Perry, Op cit., pp. 177-178.

issues.

The pre-exercise questionnaires were used to compare sex and ethnic differences in past experience with roles, desire to learn roles, and desire to play roles in the class exercise. The post-exercise questionnaires allow comparison of sex and ethnic differences in roles played in class and assessments of the effectiveness of the exercise. The pre- and post-questionnaires were analyzed together to compare students' success in meeting their personal goals for learning and playing roles. Only differences significant at the .05 level are discussed in the following section.

THE RESULTS/FINDINGS

Informal Findings

All three classes were generally enthusiastic about the idea of the Guided Design process. Attendance during the exercise was better than for preceding and following lecture classes. Neither exam grades nor grades on papers were noticeably below the quality of similar statistics classes' performance in other semesters on the topics covered.²⁶ Exam performance was generally typical and the exercise-related papers submitted by students were, in the author's judgement, unusually good. More precise comparisons were not possible.

Social interaction among class participants was clearly

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The author taught these topics using a lecture format in four similar statistics courses at Corpus Christi State University.

altered. Informal socializing before and after class increased greatly and crossed sex and ethnic lines more than was previously typical. This was noted by the author and several students.

EXPERIENCE IN ROLES AND STUDENTS' GOALS

Experience

As a group, students reported least experience in "dominator," and, curiously, "non-participant" roles. They were most experienced in being "idea presenters," "decision-makers," and "idea evaluators."

Females reported less experience - frequent or occasional - than males as "decision-makers," "idea presenters," "objectors," "idea evaluators," and "controllers." Sex breakdowns of the percentages claiming no experience and much experience are presented in Table 1. Women were more likely to have never played and less likely to have usually played most roles. Also, women indicated

Role	% Never Play		% Usually Play	
	Women	Men	Women	Men
Decision-Maker	18%	7%	55%	60%
Argument Settler	18%	20%	55%	47%
Non-Participant	73%	73%	0%	0%
Idea Presenter	27%	0%	63%	93%
Objector	54%	27%	10%	47%
Idea Evaluator	18%	0%	73%	87%
Dominator	64%	67%	0%	20%
Controller	36%	27%	27%	47%

TABLE I

they had experience (sometimes or usually) playing an average of 4.7 roles, while males averaged 4.9.

Ethnic Differences

Hispanics on the average had played 4.4 roles, while Anglos had played 5.6. A higher percentage of Hispanics had no experience being "argument settlers" and "dominators." Female Hispanics had noticeably less experience as "idea presenters" and "objectors," than male Hispanics and Anglos of either sex. More Hispanic males than Anglos, however, reported they "usually" play "decision-maker" roles.

In summary, women had less experience in roles than men. Ethnic differences were less pronounced; female Hispanics were least experienced, and male Hispanics were somewhat less experienced than Anglo males.

Students' Goals

Prior to the group exercise, students were asked to identify roles they would like to play and/or like to learn. Our interpretation of these answers assumes that a desire to "learn" a role implies a felt need to experiment with a relatively unfamiliar role. A desire to "play a role" implies an intention to practice a role with which a student has previously experimented.

The only role that a clear majority of students felt they needed to learn - or experiment with - was that of "decision-maker." The group "dominator" was also selected often, but primarily by women.

Male and female differences in perceived need to learn

various roles were minimal. Women were slightly less likely to see a need to experiment with most roles. Exceptions were the "idea presenter" and "dominator," Each claimed a majority of the women. It seems reasonable to hypothesize that women's socialization for passive roles has limited their experience in these types of interactions. Interestingly, 64% of the women and 26% of the men saw a need to experiment as group "dominators," but 40% of both women and men felt they should learn to be group "controllers."

Hispanic students wanted to learn an average of 3.9 roles. In comparison, the average for Anglos was 2.8. The minority students, Hispanic and Black, however, left less need than Anglos to learn to be "Conflict Avoiders". All the Hispanic females felt the need to learn "idea presenter," "idea evaluator," and "dominator" roles, while Hispanic males and Anglo females did not.

Curiously, male Hispanics indicated they needed to learn to be "non-participants" and "decision-makers."

Generally, all students were most - and about equally - interested in playing "decision-maker" roles. Male Anglos and female Hispanics felt the most need to learn new roles, Hispanic males least. A tentative explanation is that male Anglos are more aware of the importance of committee and group skills, and female Hispanics feel least prepared to function in small groups.

The roles a majority of students wanted to play - interpreted here as wanting to practice - were "idea presenter" and "idea evaluator," the skills which only a few students practice

in a more traditional entire-class case format. Less than 10% of the students wanted to be non-participants.

Generally, a smaller percentage of women expressed a desire to practice most roles. In fact, a third of the men but none of the women wanted to play "decision-maker" role. Group "controller" and "argument settler" attracted more women than men; in both cases not quite half the women and about one fifth of the men wanted to practice these skills. Neither of these roles can easily be practiced in most case-format classes because instructors generally perform these functions. Women wanted to practice an average of 2 roles; men an average of 2.5.

On average, Hispanics wanted to practice 2 roles, Anglos averaged 2.5. Hispanic students, male and female, were interested in practicing fewer roles, particularly those of "idea presenter" and "idea evaluator." Hispanic males were much more interested in being "decision-makers" (75% vs. 20%). Although half of the Anglo females wanted to be "idea presenters," none of the three Hispanic women did. Hispanic females were most interested in being "argument settlers" and "controllers." Again, the case method would probably not provide opportunities for students to practice these roles.

Hypothesis one seems to have been tentatively supported by the findings of this study. Women and minorities had less experience in roles than did Anglo men, and women and Hispanic males had different goals than Anglo males for experimenting with and practicing small group skills in class.

PLAYING UNFAMILIAR ROLES IN CLASS

Briefly summarized, roles played by a majority of participants were "idea presenter," "decision-maker," "idea evaluator," "objector," "controller" and "argument settler."

Males reported "usually" playing roles more often than females, although females were slightly more likely to have been "controllers" and "dominators". Differences in mean number of roles played during the exercise were not great, however; women played an average of 4.4 goals, men an average of 4.9. This includes playing roles usually and sometimes.

Ethnic differences in types of roles played were not noteworthy except that Hispanic females never played the "conflict avoider", and the only person who reported being a "dominator" was an Hispanic woman. Hispanics did play [&] fewer roles during the exercise. The average number of roles played by Hispanics was 4.1 compared to 5.1 for Anglos.

The exercise, then, does appear to have encouraged much more student participation than a typical case presentation. Women and Hispanic students did not, however, play more roles than Anglo males.

Hypothesis two asked a different question, however, Did women and minority students play more roles unfamiliar to them? There were fourteen reported instances of a student playing (in class) a role they wanted to learn - or experiment with - but had no experience in. Eleven of these fourteen were women; six were Hispanic, five Anglo. The roles thus experimented with were

"decision-maker" (1/2), "idea presenter" (2/2), "objector" (3/5), "dominator" (3/3), and "controller" (1/2). (The number in parenthesis shows the fraction of instances which involved women.) Thus, 79% of the new role experimentation was done by the 42% of students who were women.

Seven, or 50% of the instances of experimentation with new group roles was done by Hispanics (27% of the total sample). Five of these involved Hispanic Women, two were experiments of Hispanic men. Hispanics were, however, most likely to set goals for learning roles which they did not achieve. Eight of the eleven instances of this involved Hispanics. Only three of these involved Hispanic males, but these men set fewer goals for themselves.

Probably because they began with more experience, Anglo males did most of the practicing of roles (played roles they had experienced but indicated they wanted to play). Nine of the twenty-one instances of this involved Anglo males; however, seven involved women, who had less previous experience overall. Only three Hispanics met personal goals to practice a role they already had experience in. The roles most practiced were "argument settler" (5 instances) and "idea presenter" (12 instances).

Women and Hispanics took most advantage of the opportunity to experiment with new roles. They also practiced some roles as they already had played. Overall, women - Hispanic and Anglo - seemed to gain the most new experience from the exercise; Hispanic males least. These men set fewer goals for themselves, however,

~~so~~ it cannot be said that they were most likely to fail to meet personal goals. Hypothesis two has been supported by these results: women and minorities played more unfamiliar roles, although they did not dominate the practicing of already-known roles.

ASSESSMENT OF LEARNING IN EXERCISE

Learning Statistics

As a combined group, 11.5% of the students felt the Guided Design exercise was a ^{very} good way to learn statistical concepts, 61.5% was it as somewhat good, and 19.2% thought it was not good. Ethnic and sex differences in responses were not significant. Thus, students were not overwhelming impressed with Guided Design for teaching the subject matter of the course, but neither were they dissatisfied.

Learning Roles

Of the entire group of students, about 15% found the exercise a very helpful way of learning roles, 58% thought it was somewhat helpful, and 27% felt it was not good for role-learning. Sex differences in assessment were minimal, but Hispanic males were decidedly more negative and Anglo males were somewhat more positive than females about the exercise as a tool for learning group skills. Male Hispanics' lower goals for role-learning may explain their negative view of role-learning in the Guided Design exercise, but it may also be true that this class format is not particularly helpful to this group. Guided Design appears to be assessed as somewhat effective for learning statistics and roles for men and women overall. Thus, hypothesis ~~two~~ ^{three} was tentatively

upheld except for Hispanic males.

These assessments of Guided Design are, of course, assessments of the particular exercise used in these classes. This particular exercise had not been previously tested (no suitable complete design was available) and some of the students' dissatisfaction probably reflects flaws in the instructions and feedback handouts given students.²⁷ In light of this, in the author's opinion, the exercise should be interpreted as reasonably successful in teaching statistics and roles.

CONCLUSIONS AND INPLICATIONS

The study presented here must be generalized with great caution because of the small sample size, the specific Guided Design exercise used, and the relatively high percentage of minority students in the classes. The study tentatively has shown, however, that women and minority students do have greater needs than white males to develop committee membership skills. The prescriptions of relevant theory seem to be useful and applicable to choices of pedagogical formats. The Guided Design format appears, in light of these findings, to be a useful pedagogical tool for teaching these skills to all students, but particularly to women.

More research, on the small-group skills of Hispanics, especially males, and of other minority group students is needed.

Also lacking is investigation of teaching formats and their

²⁷ The author is now revising the Guided Design exercise used in this study.

effects on women and minorities. Business educators should take advantage of existing knowledge about the development of students, small group processes, and role and social skill learning.

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A 25-minute, 16mm, color film on Guided Design is available from from:

Film Scheduling Center
Modern Talking Picture Service, Inc.
2323 New Hyde Park Rd.
New Hyde Park, NY 11040

(Request film # 31864 Guided Design)

APPENDIX A

WD021850

GROUP PARTICIPATION QUESTIONNAIRE

Name: _____

Status: Check one _____ Junior
_____ Senior
_____ Graduate Student
Check one _____ Full-time student
_____ Parttime student

Age: Check one _____ Under 21
_____ 21 - 25
_____ 26 - 30
_____ 31 - 40
_____ 41 - 50
_____ 51 - 60
_____ over 60

Sex: _____ Male
_____ Female

Marital Status: _____ Never Married
_____ Engaged
_____ Married
_____ Divorced
_____ Other

Specify _____

Concentration:
or
Major (if non-
business)

_____ Management
_____ Accounting
_____ General Business
_____ Finance
_____ Other specify _____

1. In the group exercise we will do in class, what roles within your group would you like to play? Check as many as apply.

Check (✓) as many roles as apply. (Each group of phrases describes one role.)

- ___ Decision-maker for group
- ___ Conflict Avoider, Sympathetic Balancer, Missionary, Argument Settler
- ___ Non-Participant
- ___ Idea Presenter, Suggestor
- ___ Objector, Challenger, Worrier
- ___ Idea Evaluator, Rational Thinker
- ___ Dominator
- ___ Pace-setter, Controller of Progress Rate

2. Think about your experiences of working in groups - both formal and informal groups. What roles do you usually play in groups?

On the list below, put U beside roles you play often and put N beside the roles you never play.

Use as many U's and N's as apply.

- ___ Decision-maker for group
- ___ Conflict Avoider, Sympathetic Balancer, Missionary, Argument Settler
- ___ Non-Participant
- ___ Idea Presenter, Suggestor
- ___ Objector, Challenger, Worrier
- ___ Idea Evaluator, Rational Thinker
- ___ Dominator
- ___ Pace-setter, Controller of Progress Rate

3. What roles do you think would be a learning experience for you? Put a check (✓) in front of every role you feel you cannot do as well as apply. (NOTE: This will in no way obligate you to actually try that role and will not affect your grade.)

Put as many checks as apply.

- _____ Decision-maker for group
- _____ Conflict Avoider, Sympathetic Balancer, Missionary, Argument Settler
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- _____ Idea Presenter, Suggestor
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APPENDIX B

Instruction A

Frank Garcia's statistical and business consulting firm has just taken on a new consulting job. A big local investor needs some predictions of future sales volumes; the investor is considering buying a franchise from Spuds for All, a new chain featuring baked potatoes as the prime entree. A site has been selected, financing is assured, but the investor wants to be very certain that she will receive at least 10% return on her cash. According to her CPA, \$600 in sales per ~~day~~^{week} will be just sufficient to provide the 10% return.

Frank has had good experience using students in CCSU's Business Practicum, so he called the school, to see whether any students would be interested in the project. By the next day, a group of five business students have arrived at his office, heard about the project, and decided to help Frank out.

"To get started," Mr. Garcia said, "can you pinpoint a goal for your work on this project?"

Instruction P - Generate Solutions

The only issue still to be settled was the sample size. Everyone agreed that the more people they interviewed, the more certain they would be of their final results.

"Well", someone suggested, "We have to at least interview enough people to be sure that we are within 10% of the true percentage of people who would eat at the franchise." Everyone agreed that the 10% limit on error was arbitrary but reasonable.

"That means we want to be about 95% sure that we are not more than 10% from the true value, I guess," said Jane.

The group discussed various ways of selecting sample size.

Feedback A

The Practicum group suggested four goals: 1) determining whether \$600 per ^{week} day is realistic for the franchise, 2) recommending that the investor buy or not buy the franchise as planned, 3) estimating total sales volume of the franchise, 4) asking the investor to be more specific about what he wants.

One of the students, Maria, suggested that one of the most valuable functions of a consultant is to help with the problem and goal identification and clarification. The group considered this and decided that "recommending that the investor buy or not buy the franchise" was the primary goal for their work, while "determining whether \$600 per day is realistic" and "estimating total sales volume of the franchise" were sub-goals.

Instruction B

Jane, a pessimistic student, protested that the group had set a goal that was too big for them to handle. The other group members felt that it was too soon to decide what the group could or could not handle. They all agreed to begin their attack on the problem by listing the kinds of information they would like to have for the problem of advising the investor.

Feedback B

The group decided that they would like to have information on the following topics:

1. How much each "potato" customer will spend on the average.
2. What population groups are likely to be customers and how large are these groups?
3. How often would these customers patronize the franchise

Instruction C - Generate Possible Solutions

"Very good," said Frank. "I can tell you that the franchise company has found that customers all across the country spend an average of about \$3.00 per person, so that answers the first question. Unfortunately, the literature from Spuds for All states that volume of sales varies greatly from city to city for existing restaurants, so we need local data to answer questions 2 and 3." Mr. Garcia went on to suggest that the group of practicum students should be able to make a list of potential solutions to the problem of getting information on who and how often.

of

Feedback C

The group suggested the following possible solutions.

1. Survey the general public about probable patronization of Spuds For All
2. Find and analyze other published data
3. Survey the patrons of the local vegetarian restaurant
4. Survey restaurant managers

Instruction D - Choice

When the student-employees finished their list, Mr. Garcia asked that they rank the possible solutions from the most promising to the least promising.

Feedback D

The group decided that taking a survey of patrons of the only local vegetarian restaurant was the best choice - given the limited appeal of baked potatoes as entrees (at least initially). Skeptical Jane asked Mr. Garcia to suggest a better way - like statistical tests- for deciding what population to survey. "Common sense and making do are the best guides I can offer at this stage," was the reply.

With this reply in mind, the group completed the ranking.

1. Survey patrons of the local health food/ vegetarian restaurant
2. Survey other restaurant managers
3. Look for other published data
4. Survey the general public.

Instruction E - Problem Identification

Mr. Garcia explained that even though they hadn't used sophisticated techniques to rank the options, the choice satisfied his doubts because the group had thought it through and all agreed. "We are probably ready to design a survey now," suggested Maria. "Why don't we think first about what facts we really need to use in analysis later?"

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Name: _____

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Instruction B

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Instruction C - Generate Possible Solutions

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Feedback C

The group suggested the following possible solutions.

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2. Find and analyze other published data
3. Survey the patrons of the local vegetarian restaurant
4. Survey restaurant managers

Instruction D - Choice

When the student-employees finished their list, Mr. Garcia asked that they rank the possible solutions from the most promising to the least promising.

Feedback D

The group decided that taking a survey of patrons of the only local vegetarian restaurant was the best choice - given the limited appeal of baked potatoes as entrees (at least initially). Skeptical Jane asked Mr. Garcia to suggest a better way - like statistical tests- for deciding what population to survey. "Common sense and making do are the best guides I can offer at this stage," was the reply.

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3. Look for other published data
4. Survey the general public.

Instruction E - Problem Identification

Mr. Garcia explained that even though they hadn't used sophisticated techniques to rank the options, the choice satisfied his doubts because the group had thought it through and all agreed. "We are probably ready to design a survey now," suggested Maria. "Why don't we think first about what facts we really need to use in analysis later?"

Feedback E

After discussing issues of people's food preferences, eating-out habits, and economic means, the group decided that they wanted to collect facts as directly related to the proposed franchise as possible. Joe, the quiet one, suggested they needed to know how often health food restaurant patrons think they would eat at an alternative vegetarian restaurant and how many people would usually be eating with them. Everyone agreed.

Instruction F - Possible Solutions

"With these questions, we can estimate what proportion of health food customers will eat at another vegetarian restaurant." "But," Joe continued, "the questions won't tell us how many health food customers there are. For that, we probably should count customers and get an average number of customers per hour, per day, or something like that."

Mr. Garcia spoke up quickly. "Fortunately, we know the average number of customers the health food store serves weekly - open 6 days. They serve 200 people on the average. The investor knows the bookkeeper of the other restaurant. So - we just need to estimate the reactions of health food restaurant patrons with this survey."

"Great," Maria exclaimed. "Now we know what we're after - and we're halfway there. We can get down to specific plans."

"Well, I was also thinking of trying to verify customer's answers to questions somehow," said Joe. "Not everyone can tell us how often he or she would really go to a restaurant." The group agreed that this was a problem to consider. At pessimistic Jane's insistence the group took some time to consider more ways of gathering informations.

Feedback F

The group realized that they could choose among several options - the most reasonable they listed as follows:

1. Ask only the direct questions they needed.
2. Ask the direct questions and compare those answers with the size of the interviewee's group and observe how often the interviewee actually comes to the health food restaurants
3. Ask the direct questions and compare those answers with answers to questions about how often the interviewee actually comes to the health food store and how many persons he or she is usually with.

Instruction G - Choice

Jane felt that actually checking up on people's answers was necessary. Other members felt that interviewees just had to be trusted. Maria stopped the argument long enough to point out that Mr. Garcia had presented this project as a three week \$800 job.

"We must," she insisted, "try to get reliable information that will be convincing to the investor without spending too much or taking too long. Let's narrow down the possibilities from this perspective."

Feedback G

All the students agreed that it was most reasonable to ask the direct questions and some similar questions on patronization of the health food restaurant. Mr. Garcia indicated that he also agreed with the following questions.

1. How many times have you eaten at the health food restaurant in the past month? _____
2. How many people have been with you? (Please estimate an average) _____
3. If a new vegetarian restaurant were opened that you liked, how many times per month do you think you would eat at the new restaurant - on the average? _____
4. How many people would usually be eating with you - on the average? _____

Instruction II -Synthesis

During heated discussion of which questions to use in the interviews, someone suggested that the group should be very careful to plan uses for the collected data before actually doing the interviews. Everyone later agreed that it was time now to discuss specifically how they would use and interpret the sample results of each interview question selected.

Feedback H

The results of the discussion follow:

- 1) Answers to questions 1 and 3 can be compared in arriving at an estimate for the proportion of vegetarian restaurant business which will also be franchise business.

$$Q_1 = \frac{\text{times will eat at the new franchise}}{\text{times eat at vegetarian restaurant}}$$

Estimating Q_1 from the sample data:

The students agreed to use a weighted estimate for Q_1 based on the following procedure.

For each interview, answers to questions 1 and 3 will be compared and one tally mark will be made next to the correct class as shown in the following frequency table.

<u>Ratio of Answer 3 Answer 1</u>	<u>Frequency</u>
0 - .4	
over .4 - .7	
over .7 - .9	
over .9 - 1.1	
over 1.1- 1.3	
over 1.3- 1.7	
over 1.7- 2.0	
over 2.0	

Q_1 will be estimated by the formula:

$$\text{estimate of } Q_1 = \frac{\sum[(\text{mean } q \text{ for the class}) \times (\text{frequency of the class})]}{\sum \text{frequencies}}$$

Interpreting Q_1 : Jane suggested that the above formula was too simple. "How could anyone know now that they will eat twice as often at a new franchise as at an existing store? I thought we were checking up on interviewees' answers."

The group discussed this and decided to correct the formula later - if the relative frequency of the very high ratios was large.

- 2) Answers to questions 2 and 4 can be compared to estimate the number of friends that vegetarian restaurant customers would bring to the new franchise but not to the vegetarian restaurant. The group labeled the estimated ratio Q_2 .

$$Q_2 = \frac{\text{size of groups to eat in franchise}}{\text{size of groups eating in vegetarian restaurant}}$$

Estimating Q_2 from sample data:

The students agreed to use a weighted estimate for Q_2

for each interview, answers to questions 2 and 4 will be compared and one tally mark will be made next to the correct class on the following frequency table.

Ratio of Answer 4 Answer 2		Frequency
	0 - .4	
over	.4 - .7	
over	.7 - .9	
over	.9 - 1.1	
over	1.1 - 1.3	
over	1.3 - 1.7	
over	1.7 - 2.0	
over	2.0	

Q_2 will be estimated by the formula

$$\text{estimated } Q_2 = \frac{\sum[(\text{mean } q \text{ for class}) \times \text{Frequency of class}]}{\sum \text{Frequencies}}$$

Interpreting Q_2 : As for Q_1 , the group decided to view high values suspiciously, and to reevaluate the Q_2 formula after the frequency distribution is obtained.

3) Using Q_1 and Q_2

An estimate of the minimum number of customers per day at the new franchise would be based on the estimated ratios and the number of customers the vegetarian restaurant has per day.

estimated minimum franchise sales = vegetarian restaurant customers x

$$Q_1 \times Q_2 \times \$3.00$$

The group felt that this estimate of minimum sales could be meaningfully compared to the minimum franchise sales needed to justify the investment in the franchise.

Instruction I -- Problem Identification and Possible Solutions

Frank congratulated the students on their progress and said, "I guess you're ready to design your sample now." He suggested the group members now spend some time in the firm's library reviewing statistics texts.

"You need to 1) select a sampling method, 2) decide by whom and when the interview will be done, and 3) select a sample size." He suggested the group read first and then meet to discuss each question one at a time. "Remember," he cautioned, "our main goal is to advise the investor on whether to buy - but without taking too much time or money."

Later that afternoon the group reassembled and Maria asked them to explain what sampling methods they had planned.

Feedback I

The plans suggested were

- 1) Interview everyone leaving the restaurant during different times of several different days of the week.
- 2) Interview everyone in a group of two or more leaving the restaurant all day during as many consecutive days as possible.
- 3) Interview during the busiest times at the health food restaurant - lunch and dinner - and interview every third group.

Instruction J - Choice

These plans all sounded workable to the group. They were at a loss to choose until Jane reminded them that reliability of results and probable cost should be considered. This revived discussion of the options and the statistical theory they had read.

Feedback J

Everyone agreed that a random sample was best, but that it could only be approximated in this situation. It was also agreed that interviewing everyone leaving the restaurant was the closest to random they could manage.

The problem of when to interview was troubling, but Dave suggested that they randomly select time periods from several days. This idea was greeted with unanimous enthusiasm.

Instruction K- Synthesis/Planning Implementation

"OK, let's plan the sampling steps and take the random sample right now," said Maria.

Discussion of exactly how to take a random sample began.

Feedback K

The group agreed that each one hour time period in ten days time should be assigned a two digit number and a random number table should be used to select the time periods for the sample.

They produced the following numbering of time periods.

time	day 1	day 2	day 3	day 4	day 5
	Number Assigned				
10 - 11 a.m.	01	11	21	31	41
11 - 12 p.m.	02	12	22	32	42
12 - 1 p.m.	03	13	23	33	43
1 - 2 p.m.	04	14	24	34	44
2 - 3 p.m.	05	15	25	35	45
3 - 4 p.m.	06	16	26	36	46
4 - 5 p.m.	07	17	27	37	47
5 - 6 p.m.	08	18	28	38	48
6 - 7 p.m.	09	19	29	39	49
7 - 8 p.m.	10	20	30	40	50

	day 6	day 7	day 8	day 9	day 10
10 - 11 a.m.	51	61	71	81	91
11 - 12 p.m.	52	62	72	82	92
12 - 1 p.m.	53	63	73	83	93
1 - 2 p.m.	54	64	74	84	94
2 - 3 p.m.	55	65	75	85	95
3 - 4 p.m.	56	66	76	86	96
4 - 5 p.m.	57	67	77	87	97
5 - 6 p.m.	58	68	78	88	98
6 - 7 p.m.	59	69	79	89	99
7 - 8 p.m.	60	70	80	90	100

Instruction L - Gather Information

Joe mentioned that the group hadn't decided how many time periods to include in the sample. The group decided to base the sample size on the number of interviewees. Not knowing how many time periods would be needed, they decided to randomly select periods until 50 are in a randomly-ordered list. "Ok," said Frank, "get to it. Let's get a list of 50 time periods."

Feedback L

The result was the following list:

- | | |
|--------------------------|--------------------------|
| 1. day 4 ; 10 - 11 a.m. | 26. day 4; 5 - 6 p.m. |
| 2. day 4 ; 1 - 2 p.m. | 27. day 3; 3 - 4 p.m. |
| 3. day 5 ; 5 - 6 p.m. | 28. day 4; 11 - 12 p.m. |
| 4. day 7 ; 12 - 1 p.m. | 29. day 4; 7 - 8 p.m. |
| 5. day 4 ; 2 - 3 p.m. | 30. day 4; 4 - 5 p.m. |
| 6. day 2 ; 4 - 5 p.m. | 31. day 7; 3 - 4 p.m. |
| 7. day 1 ; 12 - 1 p.m. | 32. day 10; 10 - 11 a.m. |
| 8. day 1 ; 2 - 3 p.m. | 33. day 6; 2 - 3 p.m. |
| 9. day 3 ; 12 - 1 p.m. | 34. day 10; 12 - 1 p.m. |
| 10. day 9 ; 5 - 6 p.m. | 35. day 6; 7 - 8 p.m. |
| 11. day 5 ; 6 - 7 p.m. | 36. day 2; 1 - 2 p.m. |
| 12. day 5 ; 11 - 12 a.m. | 37. day 2; 5 - 6 p.m. |
| 13. day 3 ; 6 - 7 p.m. | 38. day 8; 11 - 12 p.m. |
| 14. day 5 ; 3 - 4 p.m. | 39. day 10; 5 - 6 p.m. |
| 15. day 6 ; 3 - 4 p.m. | 40. day 7; 5 - 6 p.m. |
| 16. day 7 ; 12 - 1 p.m. | 41. day 10; 11 - 12 p.m. |
| 17. day 2 ; 12 - 1 p.m. | 42. day 3; 5 - 6 p.m. |
| 18. day 9 ; 1 - 2 p.m. | 43. day 1; 7 - 8 p.m. |
| 19. day 10; 1 - 2 p.m. | 44. day 8; 5 - 6 p.m. |
| 20. day 1 ; 6 - 7 p.m. | 45. day 7; 2 - 3 p.m. |
| 21. day 9 ; 10 - 11 a.m. | 46. day 6; 12 - 1 p.m. |
| 22. day 4 ; 3 - 4 p.m. | 47. day 6; 4 - 5 p.m. |
| 23. day 9 ; 4 - 5 p.m. | 48. day 2; 3 - 4 p.m. |
| 24. day 1 ; 3 - 4 p.m. | 49. day 3; 2 - 3 p.m. |
| 25. day 3 ; 7 - 8 p.m. | 50. day 9; 3 - 4 p.m. |

Instruction H - Identifying Objectives

Next the practicum group's agenda was to decide who should do the interviewing. "What are our objectives here? What should we consider in choosing?" Frank prodded them.

Feedback H

Avoiding measurement error was the main idea, they decided. All interviewee's should be asked the questions in the same way - ideally all the interviewees answers will be affected by the same factors - the question, the atmosphere, the interviewer, etc. And, of course," commented Mr. Garcia, "you don't want to introduce a bias by leaving out any customer during the time period chosen."

Instruction H

The group members tried to put themselves in the shoes of the interviewees for a moment. Many factors which could affect interviewees' answers were mentioned. A list of possible interviewing plans was begun.

Feedback II

The list produced follows:

1. All five students take turns in interviewing, after being trained.
2. Have one student do all the interviewing and the other students try to slow down the traffic if the one interviewer gets behind
3. Hire professional interviewers
4. Have two students do all the interviewing possible - but train all five students in case they are needed.

Instruction 0 - Evaluate Alternatives and Make Choice

The practicum group spent some time trying to rank these solutions keeping in mind the data collection objectives and overall project objectives. They decided to write down the main good and bad aspects of each alternative.

Feedback 0

RANK	ALTERNATIVE	GOOD POINTS	BAD POINTS
1	Two students do as much as possible	less consistent and variable interviewer bias/ few customers need be missed	less experienced students may introduce bias during busy time
2	Have one student do all the interviewing; try to convince customers to wait	Many customers may refuse to wait to be interviewed	Interview bias will be consistent
3	Have all five students do interviewing in turns	Few customers need be missed.	Interviewer bias will be variable.
4	Hire professional interviewers	May be able to minimize interviewer bias	Cost Trade off between enough interviewers to interview everyone vs few enough interviewers to limit types of interviewer bias

The group agreed to settle on the first choice and to train students by having both practice and compare their styles of questioning.

Feedback R

The results of the 19 interviews were tabulated as follows:

Answer to #1

X_1	$f(X_1)$
0	0
1	4
2	3
3	3
4	7
5	1
6	1
7	0
over 7	0
	<u>19</u>

X_2	$f(Q_1)$
$\overline{X_1}$	
0 - .4	1
.4 - .7	2
.7 - .9	6
.9 - 1.1	4
1.1 - 1.3	3
1.3 - 1.7	2
1.7 - 2.0	1
over 2.0	0
	<u>19</u>

Answer to #3

X_2	$f(X_2)$
0	1
1	3
2	3
3	3
4	6
5	2
6	1
7	0
over 7	0
	<u>19</u>

$$\overline{Q_1} = .98$$

$$s\overline{Q_1} = .336$$

Answer to #2

Y_1	$f(Y_1)$
0	2
1	4
2	7
3	3
4	2
5	1
6	0
7	0
over 7	0
	<u>19</u>

Answer to #4

Y_2	$f(Y_2)$
0	1
1	3
2	5
3	5
4	4
5	0
6	1
7	0
over 7=	0
	<u>19</u>

Y_2	$f(Q_2)$
$\overline{Y_1}$	
0 - .4	1
over .4 - .7	1
.7 - .9	3
.9 - 1.1	5
1.1 - 1.3	4
1.3 - 1.7	3
1.7 - 2.0	2
over 2.0	0
	<u>19</u>

$$68 \quad \overline{Q_2} = 1.11$$

$$s\overline{Q_2} = .40$$

With relief, the group noted that the sample standard deviation were well below .5. They concluded that their sample was probably large enough.

Instruction S - Gather Information/Synthesis

Confident in their choice of a format, now, the group of students showed the firm's computer programmer the type of tables they wanted. The programmer promised to handle the key punching, programming, and other details of computerizing the data.

On June 20 the group was presented with a printout summarizing their interview data. Anxious to see some results of their work, they began discussing methods for estimating total sales. (See Feedback H.) Joe calculated the estimates for Q_1 , Q_2 , and estimated the minimum franchise sales.

1. How many times have you eaten at the health food restaurant in the past month? _____
 2. How many people have been with you? (Please estimate an average.) _____
 3. If a new vegetarian restaurant were opened that you liked, how many times per month do you think you would eat at the new restaurant - on the average? _____
 4. How many people would usually be with you at the new restaurant- on the average? _____
-

1. How many times have you eaten at the health food restaurant in the past month? _____
 2. How many people have been with you? (Please estimate an average.) _____
 3. If a new vegetarian restaurant were opened that you liked, how many times per month do you think you would eat at the new restaurant - on the average? _____
 4. How many people would usually be with you at the new restaurant- on the average? _____
-

1. How many times have you eaten at the health food restaurant in the past month? _____
2. How many people have been with you? (Please estimate an average.) _____
3. If a new vegetarian restaurant were opened that you liked, how many times per month do you think you would eat at the new restaurant - on the average? _____
4. How many people would usually be with you at the new restaurant- on the average? _____

Feedback Q

The group reasoned that 200 customers per week with 60 hours a week suggested about 3-4 customers per hour. To interview about 100 customers would require 25-35 hours. To be safe, they decided to take 40 hour-long time periods of interviews.

The time chart follows:

Dates	Day #	
Wed, June 8	1	12-1 p.m.; 2-3 p.m.; 6-7 p.m.; 3-4 p.m.
Thu. June 9	2	4-5 p.m.; 12-1 p.m.; 1-2 p.m.; 5-6 p.m.
Fri. June 10	3	12-1 p.m.; 6-7 p.m.; 7-8 p.m.; 3-4 p.m.
Sat June 11	4	10-11 a.m.; 1-2 p.m.; 2-3 p.m.; 3-4 p.m.; 5-6 p.m.; 11-12 a.m., 7-8 p.m.; 5-5 p.m.
June 12		CLOSED
Mon June 13	5	5-6 p.m.; 6-7 p.m.; 11-12 a.m.; 3-4 p.m.
Tue June 14	6	3-4 p.m.; 2-3 p.m.; 7-8 p.m.
Wed June 15	7	12-1 p.m.; 3-4 p.m.; 5-6 p.m.
Thu June 16	8	11-12 p.m.
Fri June 17	9	5-6 p.m.; 1-2 p.m.; 10-11a.m.; 4-5 p.m.
Sat June 18	10	1-2 p.m.; 10-11 a.m.; 12-1 p.m.; 5-6 p.m.; 11-12 p.m.

Instruction R - Gather Information

On Wednesday at noon the interviewing began as planned. By June 9 the students had 9 interviews completed. They decided that it was time to begin tabulating results and beginning analysis. The morning of June 11 was spent designing a form for tabulation and actually doing the tabulating.

Feedback P -

The group agreed that the necessary sample size for Q_1 and Q_2 could be calculated approximately by the formula:

$$n \leq (Z \cdot \frac{\sigma}{\text{error}})^2$$

Unfortunately, they had no information about σ for either Q_1 or Q_2 . (See Feedback H.)

Maria suggested that they aim for 100 interviews for now, but use the formula for n after collecting enough data to estimate σ . The group reluctantly agreed.

Joe pointed out that they could use the sample size formula to see what sample sizes would be required for different values of σ . The group began calculating sample sizes for σ of .1, .5 and 1.0.

The results were:

σ	n , sample size needed $(Z \times \frac{\sigma}{\text{error}})^2$
.1	$(1.96 \times \frac{.1}{.1})^2 = 3.84$
.5	$(1.96 \times \frac{.5}{.1})^2 = 96$
1.0	$(1.96 \times \frac{1}{.1})^2 = 384.16$

Everyone agreed that a standard deviation of greater than .5 for either Q_1 or Q_2 was unlikely. Since a sample size of 100 would be adequate for a σ of less than .5, Maria's strategy was accepted.

Instruction Q - Analysis

The group took the results of their work to Mr. Garcia for final approval before beginning to train the interviewers.

"When do you plan to begin interviewing?" Frank asked.

"The ten day sampling period should start Wednesday, June 6, the day after tomorrow," Maria said.

"And how many one-hour time periods do you suppose you'll need?" queried Frank. "Remember that they average 200 customers a week. I suggest that you make a time chart planning your sampling schedule."

GUIDED DESIGN REPORT
(Non-Group Reporters)

DUE: _____

The investor has decided that she is willing to pay for better information about the future of the potato franchise. She wants a better estimate of expected profits.

The investor will spend \$1800 and is willing to wait about five weeks for results. Write a report suggesting what information should be collected and how to collect it. Be very specific and justify your choice of recommendation.

Your grade will depend partly on (1) how well you can use problem-solving steps, (2) the degree of understanding of sampling and estimation shown, and (3) how complete your recommendation is. Make sure that it outlines exactly what to do to produce a report for the investor. Imagine you are writing instructions for a group of students to follow and include some justification of your instructions.

GUIDED DESIGN REPORT
(Group Reporters)

DUE: _____

You are responsible, for reporting on the group's decisions, conclusions, or opinions at each stage of the Guided Design project. The Feedbacks and Instructions provided you relate the experience of one group - the practicum students. Your report will relate the experience of your group.

Your grade will depend on how well your report reflects an understanding of:

- 1) The problem-solving process and
- 2) The theory of sampling and estimation.

Be specific about reporting why and when your group's decisions differed from the practicum group's decisions. You will not be graded on how well your group did but on how well you can report on what your group did.

APPENDIX C

POST-GROUP PARTICIPATION SURVEY

Name: _____

1. During the group project you have completed, what roles did you play within your group? Put 0 for roles you played often and 1 for roles you never played. (Your response will in no way affect your grade.)

Use as many H's and 0's as apply.

- _____ Decision-maker for group
- _____ Conflict Avoider, Sympathetic Balancer, Missionary, Argument Settler
- _____ Non-Participant
- _____ Idea Presenter, Suggestor
- _____ Objector, Challenger, Worrier
- _____ Dominator
- _____ Pace-setter, Controller of Progress Rate

2. During the group project you have completed, what roles did you want to play but did not or could not? Put a check (✓) beside every role you did not play but would have enjoyed or learned from playing. (Your response will in no way affect your grade.)

Use as many checks (✓) as apply.

- _____ Decision-maker for group
- _____ Conflict Avoider, Sympathetic Balancer, Missionary, Argument Settler
- _____ Non-Participant
- _____ Idea Presenter, Suggestor
- _____ Objector, Challenger, Worrier
- _____ Dominator
- _____ Pace-setter, Controller of Progress Rate

3. In the spaces below, write the names of the other members of your group.

- 1) _____
- 2) _____
- 3) _____

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- 4) _____
- 5) _____
- 6) _____

4. In the Group Member space below write the name from line (1) in Question (3) above.

Group Member (1) _____

What roles did this person play in your group? Put an O beside every role you think this person played often. (Your response will be kept strictly confidential and will not affect this person's grade.)

- _____ Decision-maker for group
- _____ Conflict Avoider, Sympathetic Balancer, Missionary, Argument Settler
- _____ Non-Participant
- _____ Idea Presenter, Suggestor
- _____ Objector, Challenger, Worrier
- _____ Dominator
- _____ Face-setter, Controller of Progress Rate

5. In the Group Member space below write the name from line (2) in Question (3) above.

Group Member (2) _____

What roles did this person play in your group? Put an O beside every role you think this person played often. (Your response will be kept strictly confidential and will not affect this person's grade.)

- _____ Decision-maker for the group
- _____ Conflict Avoider, Sympathetic Balancer, Missionary, Argument Settler
- _____ Non-Participant
- _____ Idea Presenter, Suggestor
- _____ Objector, Challenger, Worrier
- _____ Dominator
- _____ Face-setter, Controller of Progress Rate

6. In the Group Member space below write the name from line (3) in Question (3) above.

Group Member (3) _____

What roles did this person play in your group? Put an O beside every role you think this person played often. (Your response will be kept strictly confidential and will not affect this person's grade.)

- _____ Decision-maker for the group
- _____ Conflict Avoider, Sympathetic Balancer, Missionary, Argument Settler
- _____ Non-Participant
- _____ Idea Presenter, Suggestor
- _____ Objector, Challenger, Worrier
- _____ Dominator
- _____ Pace-setter, Controller of Progress Rate

7. In the Group Member space below write the name from line (4) in Question (3) above.

Group Member (4) _____

What roles did this person play in your group. Put an O beside every role you think this person played often. (Your response will be kept strictly confidential and will not affect this person's grade.)

- _____ Decision-maker for the group
- _____ Conflict Avoider, Sympathetic Balancer, Missionary, Argument Settler
- _____ Non-Participant
- _____ Idea Presenter, Suggestor
- _____ Objector, Challenger, Worrier
- _____ Dominator
- _____ Pace-setter, Controller of Progress Rate

8. In the Group Member space below write the name from line (5) in Question (3) above.

Group Member (5) _____

What roles did this person play in your group? Put an 0 beside every role you think this person played often. (Your response will be kept strictly confidential and will not affect this person's grade.)

- _____ Decision-maker for the group
- _____ Conflict Avoider, Sympathetic Balancer, Missionary, Argument Settler
- _____ Non-Participant
- _____ Idea Presenter, Suggestor
- _____ Objector, Challenger, Worrier
- _____ Dominator
- _____ Pace-setter, Controller of Progress Rate

9. In the Group Member space below write the name from line (6) in Question (3) above.

Group Member (6) _____

What roles did this person play in your group? Put an 0 beside every role you think this person played often. (Your response will be kept strictly confidential and will not affect this person's grade.)

- _____ Decision-maker for the group
- _____ Conflict Avoider, Sympathetic Balancer, Missionary, Argument Settler
- _____ Non-Participant
- _____ Idea Presenter, Suggestor
- _____ Objector, Challenger, Worrier
- _____ Dominator
- _____ Pace-setter, Controller of Progress Rate

10. In your opinion, was the group exercise an effective method for teaching the subject matter of this course?

Check one:

- ☐ Very effective
☐ Somewhat effective
☐ Not effective

11. In your opinion, was the group exercise an effective way to teach you to be a better member of a committee?

- ☐ Very effective
☐ Somewhat effective
☐ Not effective